

Appl. No. 09/827,141
Arndt dated April 5, 2004
Reply to Office action of November 5, 2003

Amendments to the claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 - 11. (Cancelled)

12. (Currently amended) An optical spectrum analyzer apparatus comprising:
an inherently polarization-sensitive tunable filter element;
polarization-maintaining optical means for defining paths whereby a light beam is directed to traverse the polarization-sensitive tunable filter element a predetermined number of times; [[and]]
a polarization control module for receiving input light for analysis, decomposing the received input light into its ordinary and extraordinary components to produce first and second light beams having respective mutually orthogonal linear states of polarization, and applying the first and second light beams to the tunable filter element by way of the optical means with their states of polarization parallel to each other and to one of the principal axes of the tunable filter element, the apparatus further comprising

means for adjusting the tunable filter element to select different wavelengths of the input light; and

means for detecting the first and second light beams leaving the tunable filter element without first recombining them optically and detecting energy at each of said different wavelengths,
wherein the polarization control module comprises means for rotating the state of polarization of at least one of the first and second light beams relative to the state of polarization of the other of the first and second light beams before application to the tunable filter element, said rotating means comprising at least one polarization-maintaining fiber.

13. (Cancelled)

14. (Cancelled)

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15. (Original) An optical spectrum analyzer according to claim 12, wherein the detection means comprises first and second detectors for detecting energies of the first and second light beams, respectively, after their traversal of the polarization-sensitive tunable filter means, and providing corresponding first and second electrical signals, respectively.

16. (Original) An optical spectrum analyzer according to claim 15, wherein the detecting means further comprises means for summing the first and second electrical signals.

17. (Cancelled)

18. (Cancelled)

19. (Original) An optical spectrum analyzer according to claim 12, wherein the angle-tuned filter means comprises a Fabry-Perot filter.

20. (Original) An optical spectrum analyzer according to claim 12, wherein the angle-tuned filter means comprises a thin film dielectric filter.

21. (Cancelled)

22. (Currently amended) An optical spectrum analyzer according to claim [[21]] 12, wherein the multi-pass optical means comprises a pair of right angle reflectors juxtaposed so as to reflect each of said light beam components back and forth between them said predetermined plurality of times while maintaining its polarization state.

23. (Currently amended) An optical spectrum analyzer according to claim 22, wherein the pair of right angle reflectors each have a pair of reflective surfaces extending at a right angle to each other, the reflectors being juxtaposed so that a light beam incident upon one of the reflectors obliquely to one of its reflective surfaces will be reflected back and forth between the right angle

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reflectors to traverse the polarization-sensitive tunable filter means said predetermined plurality of times, the reflectors being offset relative to each other so that, following the plurality of traversals, the light beams enter or leave the multi-pass optics from an outer edge portion of one of the reflectors.

24. (Currently amended) An optical spectrum analyzer according to claim 23, wherein at least one of the pair of right angle reflectors includes a planar surface extending substantially perpendicular to the paths taken by the light beams when travelling between the pair of right angle reflectors and truncating the pair of reflective surfaces short of an apex between notional extensions of the surfaces, the planar surface for either receiving or emitting at least one of the light beams.

25. (Currently amended) An optical spectrum analyzer according to claim [[21]] 23, wherein the pair of right angle reflectors is selected from porro prisms, pi prisms and hollow roof mirrors.

26. (Currently amended) An optical spectrum analyzer according to claim 22, wherein the pair of right angle reflectors is selected from porro prisms, pi prisms and hollow roof mirrors.

27. (Currently amended) An optical spectrum analyzer according to claim 24, wherein the pair of right angle reflectors is selected from porro prisms, [[and]] pi prisms and hollow roof mirrors.

28. (Currently amended). An optical spectrum analyzer according to claim 12, wherein the adjusting means is arranged to adjust the filter means to scan a predetermined spectrum of the light beam, and further comprising buffer means connected with the detector means and the adjusting means for storing indications of detected energies in association with indications of spectral tuning of the filter element.

29 - 36. (Cancelled)